AD-A248 319

University of Pittsburgh

LEARNING RESEARCH AND DEVELOPMENT CENTER

March 20, 1992

DTIC
ELECTE
APR 0 6 1992
D

Scientific Officer Code: 1142CS
Dr. Susan E. Chipman
Office of Naval Research
800 N. Quincy St.
Arlington, VA 22217-5000

Dear Susan;

This letter is a quarterly progess report for the On-Line Assessment of Expertise project (Grant N00014-91-J-1532). It covers the period from October, 1991 to December, 1991.

A great deal of progress was made during this period, in part because Joel Martin, arrived in September and began working on Olae. (The program and the project are both an accronym for On-line Assessment of Expertise.) Joel got his dissertation under the supervision of Dorritt Billman. Although his degree is in Artificial Intelligence, he has a great deal of psychological background, including the design, execution and analysis of several experiments.

As you may recall, Olae (the program) has two major parts, a user interface and a data analyzer. The user interface is nearing completion. We have rudimentary versions of all 6 tasks (problem solving, example studying, problem classification, difficulty estimation, basic approach, and conceptual problem solving). Although a pilot subject was run on the problem solving interface, and several important difficulties were uncovered, we still need to run more pilot subjects in order to make the interface smooth and friendly.

Most of the progress was on the development of the data analyzer. We settled on a basic design. There will be two major components. One is a Bayesian network builder and manager. Given a problem solving program written in a dialect of Prolog, it will solve each of the problems and build a network that will analyze subject responses to those problems in terms of the rules they know. Joel implemented most of this module during this quarter. The Cascade model of physics problems solving has been partially ported to the new rule-based language, and some small networks have been generated. How it will scale to handle larger networks remains to be seen. The second component of the data analyzer, which will be built later after some data is collected, will interface the data from the user interfaces to the Bayesian networks.

The Bayesian network package that Joel wrote turned out to be rather fast. He added the same sort of graphical editing and viewing features as are found in the leading commercial Bayesian
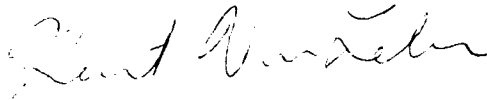
92-08703

92   4 03 235   1

network program, Hugin, which is used by our collaborators at ETS and Berkeley. However, because our package is written in Lisp, we are able to more easily interface it with other parts of the system, including the rule-based language for modelling problem solving. Several people have expressed interest in Joel's package, so we may release it to the general network community in the spring, after the bugs are shaken out of it. In particular, we are discussing the application of this package to Sherlock.

Sincerely,

Kurt A. VanLehn
Associate Prof. Computer Science
Senior Scientist, LRDC

Copies:

Administrative Grants Officer
Office of Naval Research
Resident Representative N66005
Administrative Contracting Officer
The Ohio State Univ. Research Center
1314 Kinnear Rd.
Columbus, OH 43212-1194

Director, Naval Research Laboratory
Attn: Code 2627
Washington, DC 20375

Defense Technical Information Center
Building 5, Cameron Station
Alexandria, VA 22304-6145

Statement A per telecon
Dr. Susan Chipman   ONR/Code 1142
Arlington, VA   22217-5000

NWW   4/3/92

Accesion For		
NTIS CRA&I		✓
DTIC TAB		
Unannounced		
Justification		
By		
Distribution /		
Availability Codes		
Dist	Avail a..d / or Special	
A-1		

2